Note: This is a non-Q document, to be used for guidance purposes only.

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Scientific Analyses
AP–SIII.9Q

QA: N/A

This procedure describes the process for performing and documenting scientific and performance assessment analyses and calculations.

Definition of Scientific Analysis: "A documented study that 1) defines, calculates, or investigates scientific phenomena or parameters; 2) evaluates performance of components or aspects of the overall geologic repository; or 3) solves a mathematical problem by formula, algorithm or other numerical method. …May use a previously developed and validated mathematical model, within the mathematical model's intended use and stated limitations, but may NOT revise the mathematical model in order to complete the scientific analysis. …May involve numerical manipulations that are not part of a validated mathematical model, but only if: 1) the choice of method for such manipulations is evident from standard practice and does not require justification and 2) the analysis results are not to be used to support licensing compliance arguments that require the additional confidence that would be attained by documenting the work as a model."

New definitions

Data (Collected)–Factual information obtained from investigation activities such as sample collection, physical measurements, testing, and analyses, both in the field and in the laboratory (QARD).

Direct Input–Input used to develop and produce results for products prepared in accordance with the QARD.

Preliminary Submittals–Data/technical information acquired or developed using approved Yucca Mountain Project procedures that have not received a technical review (that establishes and documents the technical validity of the data) necessary for the data to be considered qualified. Unqualified software cannot be used to produce preliminary submittals.

Product Output–Output of an approved technical product that is a controlled source, subject to the requirements of the QARD, and that has been developed in accordance with procedures in effect on or after 06/30/1999.

Technical Information–Information that does not meet the definition of data and is directly used to address safety and waste isolation issues. Technical information may include, but is not limited to, information from controlled Yucca Mountain Project reports and design products, established fact (e.g., engineering handbooks, codes, standards, density tables, gravitational laws, or other physical constants), or documented and substantiated information, including electronic databases (e.g., NOAA, NGS, NTSB) or direct input based on Code of Federal Regulations, applicable statutes, U.S. DOE Orders, and DOE Manuals (e.g., Radiation Protection Manual).

> **Nifty Points**

1. The procedure states for each process (e.g., planning, development, checking) that it is not necessary for the action steps to be performed sequentially.
1. Data must be qualified using AP-SIII.2Q and documented in section 6.0.
1. If the scientific analyses produces preliminary output that is needed as input, submit it in accordance with AP-SIII.3Q, *Submittal and Incorporation of Data to the Technical Data Management System*.
1. Software must be controlled and documented in accordance with AP-SI.1Q, *Software Management*; AP-SI.2Q, *Qualification of Level A Software*; and/or AP-SI.3Q, *Software Independent Verification and Validation*.

SECTIONS REQUIRED FOR SCIENTIFIC ANALYSIS REPORT (see AP-SIII.9Q, Attachment 3)

1. Purpose	4. Inputs	5. Assumptions
2. Quality Assurance (QA)	4.1 Direct Inputs	6. Scientific Analysis Discussion
3. Use of Software	4.2 Criteria	7. Conclusions
	4.3 Codes and Standards	Attachments

Signature on File _____7/25/03_____   __Signature on File_____7/25/03_____
Preparer   Date   YMP-LBNL Deputy Project Manager   Date